

Chapter 12: City of Marathon

The City of Marathon, incorporated in November 1999, is located in the Middle Keys and consists generally of previously unincorporated areas of Monroe County known as Marathon, Marathon Shores, and Grassy Key. The corporate boundaries of the city are as follows:

“from the East end of the Seven Mile Bridge (approximately Mile Marker 47) to the West end of the Tom's Harbor Bridge (approximately Mile Marker 60), including, but not limited to, the entire islands of Knight Key; Hog Key; Vaca Key; Stirrup Key; Boot Key; Crawl Key; East Sister's Island; West Sister's Island; Fat Deer Key; Long Point Key; Deer Key; Little Deer Key; Little Crawl Key; Grassy Key; the unincorporated areas of Monroe County commonly known as Marathon and Coco Plum; all land filled in between the islands, including all islands connected by U.S. 1, Overseas Highway and roadways connecting thereto; and all adjacent islands not connected by roadways within the boundaries of Monroe County between Mile Marker 47 and Mile Marker 60, specifically excluding all areas within the boundaries of the City of Key Colony Beach, all of the above being within the boundaries of Monroe County, Florida.”

12.1 Overview of Marathon

Geography

Marathon is situated in a precarious physical location between the Gulf of Mexico and the Atlantic Ocean. Marathon is approximately 8,320 acres consisting of a number of islands. Elevations in Marathon range from approximately 2 feet above mean sea level to approximately 7 feet above mean sea level.

Several keys make up the City and they vary greatly in size. Marathon is essentially a string of low coral islands with flat terrain. The long and narrow configuration creates a risk for storm surge from both sides of the island chain. Storm surge can be expected to be from 2 feet in a category 2 or 3 hurricane to as much as 14 feet in a category 4 or 5 hurricane. The City of Marathon would be flooded in a Category 4 or 5 hurricane, worst-case storm surge.

Marathon has no inland areas; all locations are equally vulnerable to high wind effects. The “friction factor”, which causes winds from storms to decrease over land, does not apply in the Keys.

Population

According to the 2000 U.S. Census, The City Marathon has a permanent resident population of 10,255. The seasonal population increases by as much as 4,931. There are 6786 residential housing units of various configurations. Population estimates and projections to 2010 for the permanent residents estimate an increase to 10,496 and the seasonal population increase to 5,078 for a total of 15,574.

In 2004, the Monroe County Social Services registered 11 people in the Marathon area as having special needs for hurricane evacuation assistance.

Land Use & Economy

Marathon's development is a mix of single family residences, multifamily dwellings, tourist lodgings (hotels, motels, and destination resorts), tourist-oriented uses (museums, research center, attractions), marine-related and recreational uses, commercial uses (restaurants, retail sales, banks, Realtors), medical facilities and offices, and government uses.

Future growth is limited through the Rate of Growth Ordinance adopted by Monroe County in 1992 to implement portions of its Comprehensive Plan. ROGO, as the ordinance is called, establishes a building permit allocation system for residential construction. The purpose is to encourage in-fill of platted lots served by existing infrastructure and to limit growth to enable safe and timely hurricane evacuation. Pursuant to ROGO and an agreement between the City, County and the department of Community Affairs, the annual allocation for Marathon is twenty-four permits per year for residential dwelling units.

All new construction, reconstruction, and improvements to existing buildings must comply with the current building code requirements.

The City joined the National Flood Insurance Program in October 2000 and administers a floodplain management ordinance that meets or exceeds the minimum federal requirements.

Comprehensive Plan

The City of Marathon adopted its Comprehensive Plan in March 2005. The plan includes nine elements pertaining to the future growth and development the City. Throughout the plan are numerous goals, objectives and policies that acknowledge hurricane risks, especially related to evacuation, growth, ensuring safety, providing adequate facilities, managing stormwater, working with providers of water supply and wastewater services, and

requirement compliance with codes. The Infrastructure Element and the Conservation and Coastal Element contain specific policies relevant to mitigation of future risk and damage:

- The Infrastructure Element includes such mitigation policies as:
 - Completing a detailed engineering study of drainage and implement priority storm water projects.
 - On-site wastewater disposal facilities to minimize potential environmental impacts.
 - Establish and coordinate acquisition programs.
- The Conservation and Coastal Element includes such mitigation policies as:
 - New development encroaching into the 100-year floodplain shall incorporate elevation and flood protection measures sufficient to protect against the 100-year flood.
 - The City shall maintain consistency with program policies of the National Flood Insurance Program.
 - The City shall monitor new cost effective programs for minimizing flood damage.
 - Such programs may include modifications to construction setback requirements or other site design techniques, as well as upgraded building and construction techniques. The City discourages development in the High Velocity Area and regulates redevelopment of structures non-conforming to the required base flood elevation.

12.2 City Organization and Agencies

City of Marathon is a Council Form of Government. The City Council is composed of 5 members, including the Mayor who is selected by the Council to that office. The City Council sets government policy and adopts guidance documents, such as the Comprehensive Plan, the Land Development Regulation and ordinances establishing various codes and standards.

Marathon is organized into several departments, each with authorized responsibilities that, as described below, have bearing on how natural hazards are recognized and addressed.

City Manager. The City Manager of Marathon implements the policies of the Council and administers the overall operations of the City. With regards to the floodplain management, the City Manager (or designee) is appointed to administer and implement these provisions consistent with the requirements of the National Flood Insurance Program.

Marathon Planning Department. The Marathon Planning Department is responsible for the development and maintenance of the City's Comprehensive Plan and the Land Development Regulations. Department personnel (Director, Planner, Planning Technician, Biologist) serve as staff to the City's Planning Commission and are involved in the following which are related to hazard mitigation:

- Ensures that mitigation related items in the Comprehensive Plan, such as floodplain management and natural resource management, are followed and reflected in the City's Codes and Standards.
- Participates in post-disaster appraisals and may formulate additional mitigation measures for use in the Comprehensive Plan.
- Works closely with the Building, Code Compliance, and Fire Department to ensure coordination of actions related to disaster planning, recovery, and mitigation.
- Reviews construction plans for compliance to the NFIP regulations.
- Responsible for enforcing planning and zoning standards.

Marathon Building Department. The Building Department is responsible for regulations of building construction pertaining to life safety, health, and environmental land use zoning regulations. The department is staff by the Building Official, a Building Inspector, Executive Plans Coordinator, and three Permit Clerks. Related to mitigation of hazards, the department is responsible for the following:

- Review of construction plans and issuing building permits.
- Inspection and enforcement during construction.
- Designated as coordinator for the National Flood Insurance Program.
- Assist the public in identifying and implementing flood damage prevention measures.
- Participate in post-disaster appraisals.
- Work closely with the Planning, Fire, and Code Compliance Department to ensure coordination of actions related to disaster planning, recovery, and mitigation.

**Table 12-1. Permits Issued & Inspections Conducted
(2002, 2003)**

	Fiscal Year 2002	Fiscal Year 2003
New single-family (Market Rate & Affordable)	23	24
Transient Residential Use	N/A	69
Building Permits	904	910
Electric Permits	237	179
Plumbing Permits	163	418
Mechanical Permits	216	249
Number of inspections	2,366	4,783

Marathon Code Compliance Department. The Code Compliance Department oversees after-the-fact code compliance issues pertaining to safety, health, and environmental land use zoning regulations. The department is staffed by a Code Compliance Supervisor, a Code Officer, and an Administrative Assistant. Related to mitigation of hazards, the department is responsible for: working closely with the Building, Planning, and Fire departments to ensure coordination of actions related to disaster planning, recovery, and mitigation; and participating in post-disaster appraisals.

Marathon Finance Department. The Finance Department (contracted) is responsible for overseeing the day-to-day financial requirements of the City, including establishment of purchasing procedures for all agencies. To expedite preparation for, response to, and recovery from disasters, the Finance Department may implement special emergency procedures to expedite necessary purchase and payment before, during, and after a disaster.

Marathon Engineering Department. The Public Works Division works under the direction of the Engineering Department and is responsible for overseeing the maintenance of all city facilities, including buildings, roads, and bridges. It manages the stormwater program, including design and construction of stormwater facilities. The Department also operates and maintains City vehicles.

Public Works is responsible for coordination and provision of emergency public works, initial evaluation of infrastructure damage and preparation of documentation required for federal reimbursement (including identification of mitigation components to be incorporated during recovery), and coordination of emergency debris clearing.

In executing its disaster recovery responsibilities, Public Works coordinates with the Florida Department of Transportation, Monroe County Department of Public Works, Florida Keys Aqueduct Authority, and Florida Keys Electric Co-op. The department plans, coordinates and initiates restoration of the serviceability of transportation routes, bridges, and assurance as to the safety of affected public and private dwellings and structures.

Monroe County Sheriff's Office: Marathon Division. The Sheriff's Office (contracted) is responsible for overall law enforcement and protection of residents and visitors in the City of Marathon. The department plays a key role in planning and response during emergencies to include but not limited to: coordination with Florida Highway Patrol to promote speedy and safe evacuation, communicates with base operations, field personnel, and emergency shelters.

Marathon Fire Department. The Fire Department provides emergency management assistance and direction to the City of Marathon for all life safety in connection with other duties of fire control, fire prevention, and fire and hurricane public education. The department plays a lead role in planning and response for all emergencies.

The department, as required under U.S. Homeland Security Presidential Directive 5, has adopted and uses the National Interagency Incident Management System (NIIMS) and will adopt the National Fire Service Incident Management System (IMS) Incident Command System (ICS) as the baseline incident management system. ICS is implemented for all fires, haz-mat incidents, rescues, structural collapse and urban search and rescue operations, manmade and natural disasters, and EMS responses that require two or more rescue companies.

12.3 Hazards and Risk in Marathon

Historic Storms that have affected the Marathon Area:

- 1929 Hurricane (September 22 to October 4) – The hurricane crossed over Key Largo on a northerly course. Key Largo reported winds estimated at over 100 mph, a central barometric pressure of 28 inches, and tide levels of 8-9 feet above MSL. Key West experienced tide levels of 5-6 feet above MSL and winds of 66 mph.
- 1935, Hurricane (August 29-September 10) - The small, extremely violent, Category 5 hurricane crossed the Florida Keys on a northwesterly track. The Tavernier-Islamorada area reported sustained winds estimated at 120 mph with gusts from 190-210 mph. Tide levels in the Florida Keys ranged from 14 feet above MSL in Key Largo to 18 feet above MSL in Lower Matecumbe Key.

The storm was so intense and tightly wrapped that Key West had tide levels of only 2 feet above MSL and average sustained winds of less than 40 mph. One of the most tragic aspects of the 1935 storm was the unfortunate death of many WWI veterans who were working on construction of Henry Flagler's Overseas Railroad.

- Hurricane Donna, 1960 (August 29-September 19) – Hurricane Donna curved northwestward over the Middle Keys near Long Key/Layton and then traveled northward toward the Gulf Coast towns of Naples and Fort Myers. Areas in the vicinity of the storm experienced winds speed of 128 mph and a central pressure of 28.44 inches. The storm affected the Everglades with estimated winds of 150 mph. Tide levels were reported at Upper Matecumbe Key of 13.5 feet above MSL, at Plantation Key 10+ feet above MSL, and 8.9 feet above MSL in Key Largo. As of 1992 Hurricane Donna, a Category 4 storm is listed as the 6th most intense hurricane in the US.
- Hurricane Betsy, 1965 (August 26-September 12) – Hurricane Betsy passed over Marathon while moving westward into the Gulf of Mexico. The lowest central pressure was measured in Tavernier at 28.12 inches and wind speeds were estimated to be 120 mph. Tide levels in Tavernier were 7.7 feet above MSL and Key Largo had tide levels of around 9 feet above MSL. Betsy was a Category 3 storm and is ranked 25th in intensity.
- Ground Hog's Day Storm (February 2, 1998) involved multiple F-2 tornado touchdowns resulting from a severe thunderstorms characterized by dangerous cells with high, cold cloud tops affected the Florida Keys. Areas most affected were primarily in the Middle Keys including Grassy Key and Valhalla Beach in the vicinity of Duck Key. Several buildings were damaged. Also significant problems occurred from the displacement of lobster traps which contributed to seaborne debris and navigational problems; the fishing industry suffered considerable loss of income.
- Severe thunderstorms (July 4, 1998). Severe thunderstorms with lightning and high winds came up quickly in the Middle Keys. The Weather Service Office in Key West recorded wind speeds up to 70 mph sustained. Because it was July 4th, many boats were offshore celebrating and waiting for the fireworks. Although, this event did not warrant a presidential disaster declaration, it did result in loss of life.
- Hurricane Georges, 1998 (September 25, 1998), a Category 2 when made landfall in the Lower Keys, affecting the entire county to some extent. Damage estimates approached \$300 million, including insured and uninsured damage and infrastructure loss. Maximum sustained winds at the Naval Air Station (Boca Chica) near Key West were 92 mph; gusts up to 110 mph were reported by the Emergency Operations Center in Marathon. According to the Key West Weather Service, precipitation levels in the Lower Keys were as 8.65 inches on the south side of Sugarloaf Key, 8.38 inches at Key West

International Airport, and 8.20 inches on Cudjoe Key. Tavernier in the Upper Keys recorded 8.41 inches.

- Tropical Storm Mitch, 1998 (November 4 and 5). Feeder bands from Mitch containing dangerous super cells spawned several damaging tornadoes in the Upper Keys. Sections with mobile homes were especially hard hit. Islamorada experienced an F-1 tornado; Rock Harbor and Key Largo were hit by F-2 tornadoes. According to the Department of Community Affairs, damages were estimated at \$11 million.
- Hurricane Irene, October 1999. Hurricane Irene hit the Florida Keys and Southeastern Florida. This Category 1 Hurricane dumped 10 to 20 inches of rain resulting in severe flooding in the Florida Keys and Southeastern Florida causing total damage estimated at \$800 million
- Tropical Storm Gabrielle, September 2001. Although it did not reach hurricane strength, this storm hit the southwest coast of Florida and caused flooding problems; Marathon did see some effects from the storm.

Hurricane Flooding as Predicted by SLOSH Modeling

The National Hurricane Center's surge model, called SLOSH (Sea, Lake, and Overland Surges from Hurricanes), estimates surges associated with different characteristics of tropical cyclones (track, forward speed, wind speed, etc.). The results can be combined with topographic mapping to delineate inland areas subject to flooding (with a margin of error of +/- 20%). The predicted storm surges at mile markers close to the Marathon area for various storm categories and tracks are shown in Table 12-2.

Table 12-2. SLOSH Maximum Predicted Water Depths above MSL

Ocean Side Mile-Marker 50						Ocean Side Mile Marker 61					
Track Direction	Storm Categories					Track Direction	Storm Categories				
	1	2	3	4	5		1	2	3	4	5
WSW	4	5	6	7	8	WSW	4	5	6	7	8
W	4	5	7	8	9	W	4	5	7	8	9
WNW	4	6	7	8	9	WNW	4	6	7	9	10
WN	4	6	7	8	9	NW	4	5	7	8	10
NNW	4	5	7	8	9	NNW	4	5	7	8	9
N	4	5	7	8	9	N	4	5	6	8	9
NNE	4	5	6	7	9	NNE	4	5	6	8	9
NE	4	5	6	7	8	NE	4	5	6	7	9
ENE	3	5	6	7	8	ENE	3	5	6	7	8
E	3	4	5	6	7	E	3	4	5	6	8

NFIP Floodplain Mapping

The National Flood Insurance Program (NFIP) prepared a Flood Insurance Rate Map for Monroe County (current effective map is dated February 18, 2005). The FIRM delineates areas that have been determined to be subject to flooding by the “base flood,” the flood that has a 1-percent-annual chance of flooding in any given year (commonly called the 100-year flood).

The entire City is located in areas designated as VE Zones (coastal flood with velocity hazard wave action) and AE Zones (areas subject to flooding but waves are predicted to be less than 3-feet in height). As such, all new development in the City is subject to the floodplain management standards established in the City’s Land Development Regulations.

NFIP Flood Insurance Policies in Marathon 2,682

Claims paid since 1978: 0*

<http://www.fema.gov/nfip/pcstat.shtm>
(as of December 31, 2004)

*records prior to incorporation included
in claims for Monroe County

NFIP Repetitive Loss Properties

Data provided by the Florida Department of Community Affairs identifies properties that are or have been insured by the National Flood Insurance Program and that have received two or more claims of at least \$1,000. Some of the repetitive loss properties that are listed for Monroe County may fall within Marathon; because the data cannot be geocoded based on the addressing, the actual number is unknown.

Severe Storms, Tornadoes, Water Spouts and High Winds (Other than Hurricane)

Marathon, like the rest of the Keys, has low-lying terrain. Section 6.2 characterizes the entire area encompassed by Monroe County and the cities as having equal distribution of winds. The risk of severe storms, tornadoes, water spouts and high winds in Marathon does not vary from the rest of the planning area. All new buildings, replacement buildings, and additions to existing buildings must comply with the Florida Building Code’s wind load requirements.

Rainfall/Ponding Flooding

Unlike most areas in Monroe County and the other cities, Marathon has areas that are subject to rainfall or ponding flooding. This type of flooding results from longer duration storms, which occur almost annually. As a result, residents experience access problems and water has damaged some older, non-elevated, buildings. The area with the most significant problem is 107th Street to 109th Street. Access to about 200 buildings is limited during

heavy and prolonged storms. While many of the buildings are elevated, about 50 older buildings are built on-grade and have experienced flooding. In Hurricane Georges, water up to one-foot deep caused damage.

Marathon's Stormwater Management Master Plan, prepared in 2002, identifies areas of localized flooding and a generalized overview of suggested methods to minimize local flooding such as closed drainage systems, exfiltration/slab covered trenches, and injection wells. The City has instituted a stormwater fee which will support continued evaluation, engineering and construction of drainage improvements.

Because all of Marathon is mapped as Special Flood Hazard Area, all new buildings and replacement buildings must comply with the floodplain management ordinance and be elevated or floodproofed (nonresidential only). Therefore, this type of flood damage is unlikely to affect buildings built in the future.

Marathon's Engineering Department, responsible for roads and drainage, designs all new and improved storm drainage facilities to handle the 25-year frequency rainfall.

Drought Hazards

Drought hazards for the planning area are described in Section 6.4. Marathon's risk due to drought is comparable the drought risk throughout the area.

Wildland Fire Hazards

The Florida Forestry Department indicates that in Marathon and Key Colony Beach, Grassy Key (including Geiger and Boca Chica) is the area that is most prone to wildland or brush fires. Based on data provided by Monroe County Property Appraiser, Grassy Key includes a total of 9,391 parcels of land of which 6,498 are improved. The total assessed value of improvements is \$1,562,786,704. It is important to note that this summary is not to imply that all properties would be vulnerable in any given wildfire outbreak. Future development on Grassy Key is influenced by ROGO and property owner choices; all new construction must comply with environmental restrictions.

Marathon's Critical and Important Facilities

Figure 2-2 shows the locations of the City's facilities that are listed in Table 12-3.

Table 12-3. Critical and Important Facilities in Marathon

<p>Critical/Essential Facilities:</p> <ul style="list-style-type: none"> • City Hall • Fisherman's Hospital • Florida Keys Electric Co-op • Schools (Stanley Switlick, Marathon Middle, and Marathon High) • Marathon Airport • City Marina • Nursing Home • Florida Keys Aqueduct Authority • Crawl Key Sewer Treatment Plant (future) • Fire Station #14 • 33rd Street Fire Station (future) • Monroe County Operation Center • Little Venice Sewer Treatment Plant 	<p>Marinas: (from the draft Marine Siting Plan)</p> <ul style="list-style-type: none"> • 7 Mile Grill • Abaco Sails & Marine • Banana Bay Marina • Blackfin Resort and Marina • The Boat House • Bonefish Bay Motel • Bonefish Yacht Club and Marina • Boot Key Harbor City Marina • Border Patrol • Burdines Water Front • Cannon Marine & Harbor Point • Captain Hook's Marina • Captains Three Fisheries • Coco Plum Marina & Storage, Inc. • Coconut Cay Resort & Marina • Coconut Palmas, Inc. • Coral Island Yachts • Crystal Bay Resort & Marina
<p>Hazardous Materials Sites (302 Facilities):</p> <ul style="list-style-type: none"> • Per Comprehensive Plan policy 3-3.3.1, the City will identify Hazardous Material Locations 	

Table 12-3. Critical and Important Facilities in Marathon

<p>Mobile Home and Recreational Vehicle Parks (as of January 2005):</p> <ul style="list-style-type: none"> • Aloha Trailer Park • Farnsworth Trailer Park • Galway Bay RV and Mobile Home Park • Jolly Roger Travel Park • Key RV Park • Knights Key Campground • Lion's Lair Travel Park • Ocean 25 Company, Inc. • Ocean Breeze Park West • Ocean Breeze Trailer Park • Old Towne Village • Palms Subdivision Trailer • Pelican Motel & Trailer Park • Sundance • Terra Marine Park • Trailer Ranch by the Sea • Trailerama Park • Whispering Pines • Trailers by the Sea 	<ul style="list-style-type: none"> • D & D Seafood • Driftwood Marina & Storage • Faro Blanco Resort Gulfside • Faro Blanco Resort Oceanside • Galway Bay Trailer Park and Marina • Grassy Key Marina of Marathon • Hidden Harbor • Holiday Inn • Jolly Roger RV Park • Keys Boat Works, Inc. • Keys Fisheries Market & Marina • Keys Fisheries (Joe's Stone Crab) • Kingsail Resort Motel • Knight's Key Campground • Lion's Lair RV Park • Marathon Marina & Boat Yard • Marathon Yacht Club • Marie's Yacht Harbor & Marina • Ocean Breeze RV Park & Marina • Oceanside Marine Service, Inc. • Outta The Blue Marina • Pelican Resort • Pancho's Fuel Dock • Rainbow Bend Resort & Marina • Royal Hawaiian Motel/Botel • Sea Cove Motel • Seascape Resort • Seven Mile Marina • Shelter Bay Marine • Sombrero Marina & Dockside • Sombrero Resort Lighthouse Marina • Vaca Key Marina • Valhalla Beach • Yardarm Motel
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12.4 Damage Reduction Activities

On-Going Activities

- 107th to 109th Street Stormwater Improvement Project: includes the installation of drainage and retention structures to minimize the impacts from

rainfall/flood events with a 25-year frequency. (Construction expected 2005/2006)

- West 105th to 116th Street Stormwater Improvement Project: includes the installation of drainage and retention structures to minimize the water quality impacts from rainfall/flood events with a 25-year frequency. (Construction expected 2005/2006)

Recent Projects

These projects are intended to reduce rainfall/ponding flooding and improve overall drainage and water quality of stormwater runoff:

- Sombrero Beach Injection Well: under drain in the park area leading to a 24' injection well in the parking lot. (Completed September 2004)
- 39th Street Drainage Improvements: was designed to improve existing drainage conditions at the location of 39th Street (2nd Ave), which will provide a means for discharge through two drainage wells and thereby allow bleed-down of the ponding areas. Because the wells will serve as a source for discharge during storm events, the proposed system will help to alleviate the extent of ponding. Runoff will be collected through a series of inter-connected swales, ditches and bubble up structures and converged to two drainage wells. (Completed March 2005)
- 20th Street Gulf (Boot Key Road): designed to improve existing drainage conditions on 20th Street Gulf. The work included grading shoulders, grading the drainage swales at north end of the project, place drainage structures on both sides of the road and 100 linear feet of French Drain. (Completed March 2005)
- 4th Ave Gulf Drainage: designed to improve existing drainage conditions on 4th Ave Gulf. The work included installing a catch basin at the low point of the intersection; 15" pipe installed across 4th Ave to 24" injection well. (Completed March 2005)
- 46th Street Gulf: designed to improve existing drainage conditions on 46th Street Gulf. The work included installing a catch basin and 150 linear foot French drain at the low point of the road. (Completed March 2005)
- 42nd Street Gulf: designed to improve existing drainage conditions on 42nd Street Gulf. The work included installing a catch basin and 150 linear foot French drain. (Completed March 2005)
- Ave D Drainage: designed to improve existing drainage conditions on Ave D. The work included installing a 24" Injection well and one double chamber Baffle Box. (Completed March 2005)

References:

City of Marathon, Comprehensive Plan (2005).

City of Marathon, Stormwater Management Master Plan (October 2002). Calvin-Giordano & Associates.